

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)

)
Amendment of Parts 2 and 15 of the)
Commission's Rules Regarding Spread)
Spectrum Transmitters)

ET Docket No. 96-8

RM-8435, RM-8600

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REPLY COMMENTS OF THE PART 15 COALITION

The Part 15 Coalition ("the Coalition") hereby replies to the comments filed in response to the Notice of Proposed Rulemaking ("NPRM") in the above-referenced proceeding.

As demonstrated in the Coalition's initial comments, the rule changes proposed in the NPRM represent, for the most part, the logical next step in the regulation of unlicensed wireless communications technologies. By providing equipment manufacturers greater design flexibility, the Commission will help to promote the development of the next generation of Part 15 technologies.

Nonetheless, in a few areas, the Commission's proposals go too far,¹ and in other areas, not far enough.² In addition, several parties have opposed various aspects of the Commission's proposed rule changes on narrow and short-sighted grounds.³ Thus, and for the reasons set forth more fully below, the Coalition urges the Commission to adopt the rule changes proposed in the NPRM with the clarifications and modifications set forth in the Coalition's initial comments.

¹ For instance, the Commission's concerns about the safety of narrow beam antennas are unfounded. See, e.g., Comments of Western Multiplex Corporation ("WMC") at 5-6; Comments of the Rural Cellular Corporation ("RCC") at 1; Comments of Cylink Corporation at 9-11; Comments of AT&T Wireless Services at 1. Consequently, any suggestion that extreme measures such as mandatory proximity sensors for narrow beam technologies should be rejected.

² As discussed more fully below, the Commission should eliminate the antenna gain restriction in the 2.4 GHz band as well as in the 5.8 GHz band.

³ See, e.g., Comments of Fusion Lighting at 2-3 (continuing its assault on Part 15 use of the 2.4 GHz band); Comments of Fusion Systems at 1, 4 (same).

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DISCUSSION

I. THE PARTIES TO THIS PROCEEDING SUPPORT THE COMMISSION'S PROPOSED ELIMINATION OF THE ANTENNA GAIN RESTRICTION.

A. The Parties generally Agree That The Commission Should Eliminate The Antenna Directional Gain Restrictions For Spread Spectrum Systems In The 2.4 GHz Part 15 Band.

A majority of the parties addressing the issue supported the Coalition's suggestion that the antenna gain restriction should be lifted in the 2.4 GHz band as well as in the 5.8 GHz band.⁴ As several parties noted, the Commission's concerns regarding the potential for an increase in interference problems in the band are unfounded. To begin with it is easy to overstate the significance of interference in the Part 15 bands. As Metricom points out, traditional conceptions of "interference" really have no meaning in an uncoordinated Part 15 band in which all unlicensed technologies are designed to accommodate some ambient radio noise.⁵

In any event, however, the implicit assumption in the NPRM that the use of narrow beam antennas will increase the level of "interference" in the Part 15 bands is called into question by the comments filed in this proceeding. Several parties, including the Coalition, demonstrated that the use of narrow beam antennas actually will help to reduce congestion in the 2.4 GHz band by lowering the level of interference in the vicinity of the transmitter but outside of the transmit beam. As WMC explained, the "use of directional, narrow beamwidth antennas increases the ability to reuse a given frequency, in a given area, relative to the use of omnidirectional or wide beamwidth antennas."⁶

Moreover, the ability to incorporate a narrow beam antenna into a Part 15 technology will allow Part 15 systems to operate more efficiently in a band of spectrum heavily used by consumer ISM devices.⁷ With the increase in reliability

⁴ See, e.g., Comments of WMC at 3-4; Comments of RCC at 1; Comments of Microwave Communications Technology, Inc., at 2-3; Comments of Metricom at 4-5; Comments of Cylink; Comments of AT&T Wireless Services at 1; Comments of Apple Computer Company at 8; Comments of The American Petroleum Institute ("API") at 5.

⁵ Comments of Metricom at 2-6.

⁶ See, e.g., Comments of WMC at 6. WMC demonstrates, using the example of a wireless LAN, that narrow beam technologies will be less likely to pose a threat to point-to-multipoint systems than vice versa. Other members of the Coalition had run models that reach the same conclusion.

⁷ See NPRM ¶ 9; see also Comments of Metricom at 4. Indeed, to ensure reliable long-term operation of

and range of transmission capabilities afforded by directional antennas, Part 15 technologies can be used to provide a wide variety of services that advance the public interest. Cylink notes that its outdoor systems alone, which use directional antennas pursuant to an FCC waiver, support “intelligent transportation system communications links for traffic monitoring and signal light control, high speed Internet connectivity for schools, the linking of government offices, energy utility applications, telemedicine circuits, connection of cellular and PCS sites, and thin route T-1 common carrier links (often in rural areas).”⁸ Thus, the use of narrow beam Part 15 technologies operating in the 2.4 GHz band can provide numerous benefits at the cost of little or no additional interference.

Indeed, the use of narrow beam antennas will resolve, rather than create, spectrum sharing problems. As several manufacturers of Part 18 devices noted, RF emissions from ISM devices are likely to pose an increasingly significant threat to low-power telecommunications services in this band.⁹ The use of narrow beam antennas is a spectrally efficient technological response to this threat, demonstrating that greater design flexibility, not increased regulation, is the best answer to the concerns raised by the Part 18 manufacturers.

The parties that oppose the elimination of the antenna gain restriction at 2.4 GHz offer no substantial reason or data to support their position. Cushcraft, for example, merely states its conclusion — that the increasing use of the 2.4 GHz band by mobile and portable users makes it inappropriate for systems using directional antennas — without explanation.¹⁰ Similarly, Rockwell International posits without support, that “[u]nlicensed use of high gain antennas could cause unacceptable levels of interference to widely used portable consumer Part 15 systems such as cordless telephones [t]he projected wide proliferation of wireless LAN systems in the 2450 MHz ISM band could also be adversely affected by the deployment of high gain antennas”¹¹

As demonstrated above, however, these concerns are baseless. There is no

a point-to-point Part 15 system, it is likely that the users of such systems will site outdoor narrow beam antennas so as to avoid obstructions or potential sources of RF noise. This will further reduce the likelihood of unintended interference to and from such systems.

⁸ Comments of Cylink at 2.

⁹ See, e.g., Comments of Fusion Lighting (suggesting the adoption of immunity standards for Part 15 technologies); Comments of Fusion Systems (same).

¹⁰ Comments of Cushcraft at 3.

¹¹ Comments of Rockwell International at 3.

indication that the use of narrow beam antennas will substantially increase the level of interference at 2.4 GHz or impede the operation of cordless telephones or wireless LANs. The Commission's tentative decision to retain the antenna gain restriction in this band, therefore, should be abandoned.

B. No Corresponding Reduction In Power Output Is Necessary For Part 15 Technologies Using Narrow Beam Antennas.

The comments filed in this proceeding also amply support the conclusion that the Commission's proposed reduction in output power of 1 dB for each 3 dB that antenna gain exceeds 6 dBi, and the proposed limits on horizontal and vertical beamwidths, are unnecessary.¹² Since narrow beam technologies will not pose a threat of interference to other operations, there is no need for the proposed remedial step. As WMC explained, these proposals are "not in the public interest because [they] would unnecessarily increase the cost and greatly (not slightly) reduce the range and restrict the use of point-to-point systems that are currently greatly valued by industrial and commercial operators. It clearly constitutes micro-managing the standards of what is, after all, unlicensed frequency bands."¹³

To the contrary, API suggested that users should be allowed to "compensate for transmission line losses by increasing the transmitter power and/or antenna gain accordingly."¹⁴ The Coalition supports this proposal. Part 15 transmitter power limits should be measured at the antenna and allow for the use of technologies that will account for transmission line losses. This will level the field for all Part 15 equipment, regardless of antenna configuration.

C. No Party Supported The Imposition Of Restrictions On Cross-Border Transmissions By Part 15 Technologies Using Narrow Beam Antennas.

The Coalition strongly opposed the Commission's proposal to "limit operation [of narrow beam Part 15 technologies] near the Canadian and Mexican borders."¹⁵ As every party addressing the issue recognized, any such limitation would unfairly and unnecessarily limit legitimate uses of Part 15 technologies near the U.S. borders.¹⁶

¹² See, e.g., Comments of Cylink at 12-13; Comments of WMC at 9-10.

¹³ Comments of WMC at 10.

¹⁴ Comments of API at 2-3.

¹⁵ NPRM ¶ 15.

¹⁶ See, e.g., Comments of AT&T Wireless; Comments of RCC; Comments of WMC at 9.

II. THE COMMISSION'S PROPOSAL TO REDUCE THE NUMBER OF FREQUENCY HOPPING CHANNELS IN THE 902-928 MHz BAND WAS WELL RECEIVED.

A. The Maximum Number of Hops Required Under Section 15.247 Should Be Reduced To 25.

In the NPRM, the Commission proposed reducing the number of frequency hopping channels required under Section 15.247(a)(1)(i) from 50 to 25 for frequency hopping spread spectrum systems operating in the 902-928 MHz band, provided that those systems employ hopping channel bandwidths of at least 250 kHz and the maximum authorized transmitter power for frequency hopping devices using fewer than 50 channels is reduced to 500 mW. The parties that addressed this issue generally supported the Commission's proposal. Apple, for instance, explains that the proposed reduction will

reconcile and rationalize the band-sharing conditions among LMS and Part 15 devices and should be adopted. Without this change ... maximum-bandwidth frequency-hopping devices must transmit in many frequency bands that may already be in use by, or at least are available for use by, LMS systems.... With the proposed change ... systems with the maximum allowed bandwidth (500 kHz) would be able to avoid most of the frequencies protected for wideband multilateration operations.¹⁷

The only objections to this proposal relate to the possible impact that the reduction in required hops could have on short-duration transmission systems operating under Section 15.249 of the rules and on LMS systems operating under Part 90.¹⁸ The Coalition, believes, however, that the proposed reduction in the maximum output power of frequency hoppers using less than 50 hops from 1 watt to 500 mW is adequate in these regards. The limited channel occupancy time of the frequency hopper operating at this power will reduce the potential for harmful interference to other users of the band.

Further, there is no basis for limiting the channels on which a frequency hopper using fewer than 50 hopping channels may transmit as suggested by Teletrac. As the Commission recognizes in the NPRM, the proposed reduction in the

¹⁷ Comments of Apple at 3.

¹⁸ See Comments of Ericsson Corporation at 1-4; Comments of Teletrac License, Inc., ("Teletrac") at 2-6 (arguing that the Commission should prohibit or restrict the use of channels in the multilateration LMS sub-bands by spread spectrum users that opt to hop among fewer than 50 frequencies).

number of frequencies required to be used by frequency hopping Part 15 technologies will reduce, rather than increase, the spectral occupancy of spread spectrum frequency hoppers.¹⁹ Indeed, as Teletrac itself notes, designers of Part 15 systems that use fewer than 50 hopping frequencies will have an incentive to avoid the channels in the LMS bands.²⁰ There is no need, therefore, for regulatory intervention on the selection of channels by frequency hoppers.

B. The Proposed Reduction In The Number Of Required Hops Would Permit Additional Short Duration Transmission Systems.

By reducing the number of required hops to 25, the Commission would facilitate the development of a wide range of important short duration transmission technologies. The crucial factor is that the spread spectrum concepts of § 15.247 are met. For example, in its comments, Itron, Inc. has advocated, among other things, a parallel receiver alternative to the formal hopping synchronization requirements. The Coalition agrees that the use of parallel receiver architecture, as long as the receiver has the same number of channels as that transmitted by the transmitter, and the same bandwidths, should be deemed to be an adequate substitute for synchronized hopping. The additional flexibility that would be provided by such a rule modification would allow system designers to account for a variety of market conditions. This would not undermine the fundamental characteristics of spread spectrum operation.

III. THE COMMISSION SHOULD REJECT SUGGESTIONS THAT THE PART 15 RULES SHOULD BE MODIFIED BASED ON CHANGES TO THE LMS RULES.

Teletrac urges the Commission to “clarify” that, although frequency hopping systems that comply with the current regulations are entitled to a presumption of noninterference to LMS systems, that presumption would not apply to systems that use hopping channels in the M-LMS sub-bands while operating on fewer than 50 hopping frequencies. Such a rule, however, would not be a “clarification” of any existing rule or policy, but an entirely new rule based on a novel approach to administrative rulemaking. For the reasons set forth in the comments of the Coalition and others,²¹ the Commission should reject this novel approach. If, upon

¹⁹ E.g., NPRM ¶¶ 30, 33 (use of fewer hopping channels will reduce the potential for interference).

²⁰ Comments of Teletrac at 6; see also Comments of ADTRAN at 4 (reduction in hops would minimize cross interference with LMS systems).

²¹ E.g., Comments of TIA at 5; Comments of Lucent Technologies, Inc., at 3.


reconsideration, the LMS rules are changed in ways that require further modification to the Part 15 rules, the Commission should initiate a new Part 15 proceeding addressing such modifications.

CONCLUSION

With the modifications and clarifications described above and in the Coalition's initial comments, the Coalition generally supports the rule changes proposed by the Commission in the NPRM.

Respectfully submitted,

THE PART 15 COALITION

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